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AUTHOR	Lopez, Maria G.; Tashakkori, Abbas
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ABSTRACT

The purpose of this study was to examine the short-term effects of a two-way bilingual education program on the literacy development of students in kindergarten and first grade. Two groups of children were compared in terms of their academic achievement in English language arts. The groups included students with limited English proficiency (LEP) as well as students who were not LEP. One group was instructed in English approximately 70% of the time and in Spanish approximately 30% of the time in a two-way bilingual education (Extended Foreign Language (EFL)) program. The academic performance of these students was compared with that of a group of students who attended the same school but were enrolled in a regular program. Participants were 46 treatment group students in kindergarten, compared with 41 other kindergarten students, and 57 first graders, compared with 71 other first graders. Results indicate that after 1 year of the intervention, there were statistically significant differences between the two groups only in sight vocabulary (at kindergarten and grade 1) and in alphabet (kindergarten). In all other areas of language development, there were no statistically significant differences between the achievement scores of the two groups. Results show that students in the EFL program make adequate academic progress, confirming the usefulness of the two-way bilingual program in reducing the achievement gap between LEP students and others. (Contains 3 tables and 14 references) (SLD)

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Effects of Two-Way Bilingual Education on the Literacy Development of Students in Kindergarten and the First Grade

Maria G. López

and

Abbas Tashakkori, Ph.D.

Florida International University

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Purpose

The purpose of this study was to examine the short-term effects of a two-way bilingual education program on the literacy development of students in kindergarten and first grade. Two groups of children were compared in terms of their academic achievement in English language arts. The groups included students with Limited English Proficiency (LEP), as well as students who were not LEP. One group was instructed in English approximately seventy percent of the time and in Spanish approximately thirty percent of the time in a two-way bilingual education (Extended Foreign Language, or EFL) program. The academic performance of these students was compared to that of a group of students who attended the same school but were enrolled in a regular program rather than in the EFL program.

Theoretical Framework

Throughout the years, diverse, and often conflicting, instructional approaches have been implemented to meet the educational needs of children from immigrant families. These have ranged from "English only" approaches that minimize school use of the students' native language to bilingual education approaches that build on the students' linguistic backgrounds and seek to facilitate English language acquisition while maintaining and enhancing native language skills.

In contrast to the "sink or swim" paradigm advocated by opponents of bilingual education, the theoretical framework for two-way bilingual education programs is rooted in the transactional relationship between the first and second languages. Nguyen, Shin, and Krashen (2001) assert that the use of the L1 is not detrimental to the development of spoken English. In fact, it may even accelerate second-language acquisition and the development of academic skills in the L2.

As an explanation of this transactional relationship between the two languages, Cummins (1993) posed the interdependence hypothesis, which states that there is a transfer of knowledge, skills, and processes across languages, and that the development of L1 literacy skills facilitates the acquisition of academic skills in a second language. A fundamental tenet of this theory is that there is a common underlying language proficiency that determines an individual's performance on cognitive and academic tasks.

Unfortunately, variety in program implementation has caused difficulty in interpreting research results in American classrooms, as not all research reports provide detailed information about the program(s) being studied (Porter, 1997). As a result, opponents of bilingual education label the government's bilingual education programs a "failure," as (supposedly) too many children have failed to become fluent in English. These generalized statements rarely specify which type of program is the culprit.

Notwithstanding this, several researchers (Collier, 1992; Thomas & Collier, 1997; Ramírez, 1992) have concluded that bilingual education programs that provide "LEP students with substantial instruction in their primary language [do] not interfere with or delay their acquisition of English language skills, but [help] them 'catch-up' to their English-speaking peers in English language arts, reading, and math" (Ramírez, 1992, p. 1).

Data Sources

Site. The study was conducted in an elementary school, in a predominately Spanish-speaking school district in the South. Immigration has a great impact on the school district, as a considerable proportion of its students come from immigrant families. The school represents this. Approximately 34% of the school population receives English as a Second Language (ESOL) instruction, and 90% are native Spanish-speakers. The socioeconomic background of the school population is diverse, as 56% of all students receive free or reduced lunch.

Participants. Participants in the study were 87 students (43 males and 44 females) enrolled in kindergarten and 128 students (75 males and 53 females) enrolled in first grade. The students participating in the study were those classified as ESOL level 3, 4, or 5, as well as students classified as non-ESOL. In the school district where the study was conducted, students classified as ESOL level 3 and 4 receive, as part of their Language Arts program, special instruction in ESOL. Students classified as level 5 no longer participate in ESOL, but their academic performance is monitored for a period of two years once they exit the program. Students classified as "Gifted" or "Learning Disabled" were excluded from the analyses, as they did not participate fully in the EFL or regular programs but were "pulled-out" to receive special instruction during part of the school day.

As expected, there were pre-existing differences between the experimental and control groups in terms of language proficiency in both levels (kindergarten and first grade). Table 1 presents the demographic and language proficiency composition of the two groups. A greater percentage of students was classified as ESOL in the experimental group than in the control group (74% as compared to 15% in kindergarten, and 67% as compared to 55% in the first grade). Furthermore, in kindergarten, the experimental group included a greater percentage (57%) of children on free/reduced lunch than the control group (44%).

Table 1

Demographic and other characteristics of the experimental and comparison groups

	Kindergarten				First Grade			
Demographic and Other Characteristics	Treatment Group		Comparison Group		Treatment Group		Comparison Group	
	n	%	n	%	n	%	n	%
Gender								
Male	22	48	21	51	33	58	42	59
Female	24	52	20	49	24	42	29	41
Lunch Status								
Free/Reduced	26	57	18	44	27	47	32	45
Full Price	20	43	23	56	30	53	39	55
Language Proficiency								
ESOL	34	74	6	15	38	67	39	55
Non-ESOL	12	26	35	85	19	33	32	45
Total	46	100	41	100	57	100	71	100

Instruments. Two sets of instruments were utilized to measure the students' literacy development in the two different treatments, or programs (i.e. EFL and "regular"). One set measured the literacy growth of kindergarten students, and the other measured the literacy development of first grade students. Most of these assessments, which were used to measure literacy in English, had been developed by the district and were widely used to measure the literacy goals and objectives delineated in the district's Language Arts curriculum. All assessments, except the Scholastic Reading Inventory, were administered at the beginning and at the end of the school year.

Procedure

The study used a two-group pretest/post-test design. The students participating in EFL made up the first group, while students not in the EFL program made up the second group. Assignment of students to the experimental and control groups was voluntary, although recruitment strategies were employed.

The students participating in the EFL program received two hours of English language arts, half an hour of social studies in English, one hour of mathematics in English, an hour of Spanish language arts, and half an hour of science in Spanish. Students in the control group received all instruction in English, except for a weekly average of two and a half hours of Spanish language arts.

Once the groups were formed, the aforementioned pretests were administered at the beginning of the school year, and instruction in all classrooms reinforced the goals and objectives of the district's curriculum, as well as the benchmarks provided by the State Standards. As the teachers worked in collaborative teams, the only difference in the curriculum imparted was the amount of time allowed for instruction in English and Spanish. At the end of the school year, the post-tests were administered, and the results were analyzed.

Results and Discussion

As was previously discussed, a pretest-posttest control group design was used for this study. Since parents had the choice of selecting the type of program for their children, the assignment of children to the experimental and control groups was not random. As was evident in Table 1, there were slight differences between the treatment and comparison groups in terms of the proportion of students participating in ESOL and also those who received free/reduced lunch.

Program Effects at Kindergarten Level

Pretest Scores: Multivariate analysis of variance (MANOVA) with two factors (treatment group and SES level) and three dependent variables (alphabet knowledge, sight word mastery and writing skill) indicated significant differences between the pretest scores of the experimental and comparison groups (Wilks Lambda = 0.28, $F(3, 81) = 70.251$, $p < 0.01$). Means and standard deviations are presented in Table 2. These initial differences were expected, and pointed to the fact that the experimental group had a greater need for the special program. Indeed, research indicates that students entering kindergarten with developed phonemic awareness skills demonstrate significantly higher reading knowledge skills in subsequent school years (National

Center for Education Statistics, 2002), thus suggesting the special need of the experimental group that entered kindergarten at a disadvantage. Main effect of SES (free/reduced lunch vs. full-price lunch) on the combination of dependent variables was marginally significant (Wilks Lambda = 0.91, F (3, 81) = 2.66, p = 0.05). The interaction of group and SES was not significant (F (3, 81) = 0.46, p = 0.71).

Following these significant multivariate main effects, univariate main effects on each single dependent variable were examined. The main effect of treatment on the writing scores was statistically significant (F (1,83) = 178.09, p < .01, eta-squared = .068). Group differences in the other two dependent variables were not statistically significant (F (1,83) = 0.06 for Alphabet, and F (1,83) = 1.41 for Sight Words). When the main effect of SES on dependent variables was explored, the only significant effect pertained to Alphabet (F (1,83) = 7.65, p < .01, eta-squared = 0.08). Main effect of SES on the other two variables was not significant (F (1,83) = 1.26 for Sight Words, and F (1,83) = 0.31 for Writing).

Posttest Scores: Multivariate analysis of variance with the three post-test scores as dependent variables revealed a main effect of group (Wilks Lambda = 0.79, F (3, 81) = 7.03, p < 0.01). Neither the main effect of SES nor its interaction with treatment was significant (F (3,81) = 0.99, and F (3,81) = 0.76, respectively). The mean scores of the two groups are presented in Table 2. Univariate tests of the group main effect indicated that there were no significant differences between the experimental and comparison groups in Writing (F (1,83) = 0.281, p = 0.60), i.e. the gap between the EFL and the control group had disappeared. However, the EFL group lagged behind the comparison group in Alphabet and Sight Words test. A statistically significant difference (F (1, 83) = 4.14, p < 0.05) was found between the average Sight Words scores of the two groups (mean of 59.28 vs. 90.12). However, that difference was less than 1/2 standard deviation (Sd = 66 and 63 for the two groups, respectively) and is, therefore, negligible. Similarly, although the difference in Alphabet scores was statistically significant (F (1, 83) = 10.55, p = 0.002), its magnitude (mean of 86.35 vs. 95.85) had weak practical significance when it was compared to the magnitude of the standard deviations of the two groups (17.36 and 5.98, respectively).

Table 2

Mean and the standard deviation of the pretest and post-test scores of the kindergarten cohort

	Treatment Group		Comparison Group		EFL main effect
Measures	Mean	SD	Mean	SD	F (1, 83)
Pretest Scores					
Alphabet	39.26	33.12	43.37	32.64	0.062
Sight Words	4.63	8.99	7.2	8.97	1.406
Writing	1	0	3.1	1.04	178.091*
Post-Test Scores					
Alphabet	86.35	17.38	95.85	5.98	10.547*
Sight Words	59.28	66.09	90.12	62.8	4.141*
Writing	5.33	1.03	5.2	1.23	0.281

*p < 0.05

Program Effects at First Grade Level

Pretest Scores: A 2x2 multivariate analysis of variance (MANOVA) with two factors (treatment group and SES level) indicated that the main effect of group was significant (Wilks Lambda = 0.78, F (6,119) = 5.53, $p < 0.01$). Neither SES nor its interaction with group was significant. Univariate tests indicated that there were differences between the experimental and control groups in four of the six dependent variables (Alphabet and Running Records were the exceptions). The mean scores of the two groups are presented in Table 3. As shown, at the beginning of the year, the experimental group had lower scores in all six areas, although in a few of them the differences were relatively small.

Posttest Scores: MANOVA on the six post-test scores, as well as the SRI test, pointed to significant differences between the two groups (Wilks Lambda = 0.88, F (7, 118) = 2.32, $p < 0.05$). Neither the main effect of SES nor its interaction with treatment group was significant (F (7, 118) = 0.921, and F (7, 118) = 0.725, respectively). Following the significant multivariate main effect of treatment, univariate effects were examined. Results indicated that the group difference was significant in only one post-test score: Sight Word Recognition Test (F (1, 124) = 6.65, $p < 0.05$). On all other six dependent variables, the differences between the mean of the EFL and the comparison group were non-significant. When the magnitude of the difference between the two groups in Sight Words (128.38 and 163.47, respectively) is compared to the magnitude of the standard deviations of the scores within each of these two groups (123 and 278, respectively), the practical significance (see Thompson, 1998) of that difference proves to be very small (less than 1/3 of the pooled standard deviation).

Table 3

Mean and the standard deviation of the pretest and post-test of the first grade cohort

	Treatment Group		Comparison Group		EFL main Effect
Measures	Mean	SD	Mean	SD	F (1, 124)
Pretest Scores					
Alphabet	90.32	10.46	91.59	10.49	0.534
Phonics	61.65	19.76	71.55	22.35	7.173*
Running Record	1.3	0.6	1.32	0.79	0.047
Sight Words	18.09	18.8	56.73	77.41	12.917*
Narrative Writing	1.09	0.29	1.31	0.55	7.746*
Expository Writing	1.09	0.29	1.62	0.74	24.846*
Post-Test Scores					
Alphabet	96.89	2.78	96.49	9.43	0.163
Phonics	89.88	9.31	87.72	12.38	1.342
Running Record	2.82	0.83	3.03	1.04	1.417
Sight Words	208.6	128.38	278.27	163.47	6.65*
Narrative Writing	2.18	0.98	2.51	1.01	3.539
Expository Writing	2.35	1.06	2.65	1	2.585
SRI Percent	38.38	17.21	44.44	25.95	1.981

*$p < 0.05$

Conclusion

The main goal of the current study was to examine the effectiveness of a two-way bilingual program in reducing the achievement gap between students with limited language proficiency and those who were relatively more proficient in English. The experimental program was implemented in kindergarten and first grade level. The hypothesis was that the achievement gap between the experimental and control groups would decrease or completely disappear as a result of the intervention. Results indicate that, after one year of the intervention, there were statistically significant differences between the two groups in only Sight Vocabulary (K and first grade), and Alphabet (K). In all other areas of language development, there were no statistically significant differences between the achievement scores of the two groups. In the areas in which a statistically significant gap was present, the practical/policy significance of the difference was relatively small.

The literature (e.g. Collier, 1992, Thomas and Collier, 1997) has pointed to substantial gaps between the academic achievement of LEP and non-LEP students. In the current study, such a substantial gap was not present after a year of the intervention. The results clearly suggest that students participating in the EFL program made adequate academic progress, even when initial differences existed. This confirms the potential usefulness of the two-way bilingual education programs in reducing the achievement gap between limited English proficient students and students whose English skills are more developed. As limited English proficient (LEP) children comprise an increasing proportion of the nation's multicultural classrooms, it becomes crucial for educators to become more knowledgeable about the effect of different instructional programs on the language acquisition of LEP students and to use this knowledge to further the academic development of the aforementioned students.

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